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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,827	08/05/2004	Michael J. MacDonald	FIS920040163	4826

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EXAMINER	
DUONG, KHANH B	

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/710,827	MACDONALD, MICHAEL J.	
	Examiner	Art Unit	
	Khanh B. Duong	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *17-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/5/04 and 9/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group I (claims 1-16) in the reply filed on July 26, 2006 is acknowledged. The traversal is on the ground(s) that "the Office fails to prove that a serious burden exists relative to the separation of Group I from Group II". This is not found persuasive because prosecuting two separate and distinct inventions simultaneously is a very serious burden on the Examiner.

The requirement is still deemed proper and is therefore made FINAL.

Claims 17-30 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Currently, claims 1-16 are active in this application.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on August 5 and September 20, 2004 have been considered by the examiner.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD OF FORMING A POLISHING INHIBITING LAYER USING A SLURRY HAVING AN ADDITIVE.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 and 12-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuchiya et al. (U.S. Patent No. 6,530,968).

Re claim 1, Tsuchiya et al. ("Tsuchiya") discloses in FIGs. 1 and 2 a method for polishing a wafer, the method comprising the steps of: providing a semiconductor wafer having a topography including a different topography locations (e.g. dense and isolated interconnect areas); applying a slurry that includes an additive for forming a polishing inhibiting layer in situ across the topography, the polishing inhibiting layer creating a polishing rate for the topography that is inherently non-linear with polishing pressure; and chemical mechanical polishing the topography [see col. 5, lines 12-36].

Re claims 2-7, Tsuchiya discloses the additive to form the "polishing inhibiting layer" includes one of: an anionic surfactant (e.g. sodium (salt) sulfate and dodecyl sulfates) and a cationic surfactant (e.g. CTAB and cetylpyridinium chloride) [see col. 5, lines 12-36]. Thus, Tsuchiya discloses all the formulaic limitations relating to anionic and cationic surfactants as claimed in claims 3-6.

Re claim 8, as discussed above, since Tsuchiya discloses the same conditions as the instant invention, it must be inherent the "polishing inhibiting layer" decreases a polishing rate of one of the topography locations to a level defined according to: $PR=k*(P-P_{crit})$, where PR is the

polishing rate, k is a coefficient of friction of a slurry, P is a polishing pad polishing pressure at one of the topography locations, and P_{crit} is a critical removal polishing pressure to be applied for removal of the polishing inhibiting layer.

Re claim 9, as discussed above, since Tsuchiya discloses the same conditions as the instant invention, it must be inherent that the polishing inhibiting layer was removed by polishing at a pressure greater than the critical removal polishing pressure.

Re claims 12 and 13, Tsuchiya discloses controlling a pH level of the slurry inherently to be between an isoelectric point of the topography and an isoelectric point of a polishing particle of the slurry to ensure adhesion of the polishing inhibiting layer to a surface of the topography, wherein the controlling step includes adding at least one of an acid and a base including sodium hydroxide and potassium hydroxide [see col. 7, lines 3-10].

Re claim 14, Tsuchiya expressly discloses in FIG. 1 the difference in topography between the different topography locations is at least one of height and pattern density.

Re claims 15 and 16, Tsuchiya discloses in FIG. 1 the topography includes silicon dioxide 3 and silicon nitride 2, the slurry includes a polishing particle including ceria and silica [see col. 3, lines 65-66], the additive includes cetyltrimethyl ammonium bromide (CTAB) and sodium dodecylsulfate [see col. 5, lines 16-37], and a pH level of the slurry is no less than approximately 3 and no more than approximately 9 [see col. 7, lines 3-5].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya.

Re claims 10 and 11, Tsuchiya fails to disclose the critical removal polishing pressure P_{crit} is no less than approximately 2 psi and no greater than approximately 20 psi, and the polishing step includes applying a downforce of no more than 4 psi above the critical removal polishing pressure P_{crit}, and no less than 4 psi below the critical removing polishing pressure P_{crit}.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to optimize and select appropriate pressures for the CMP process. The

selection of parameters such as energy, power, concentration, temperature, time, depth, thickness, etc., would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in temperature, or in concentration, or in both, would be an unpatentable modification. Under some circumstances, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce new and unexpected result which is different in kind and not merely degree from results of prior art ... such ranges are termed 'critical ranges' and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). See also MPEP 2144.05.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KBD

M. Wilczewski
Primary Examiner
TC 2800